

An environmental and social approach in the modern architecture of Brazil: The work of Lina Bo Bardi



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ABSTRACT

The architecture of Brazil, which has recently been in the focus with major events (World Cup and Olympics) holds a particular place in Latin America's architecture and is known for its bold modernism. One of the most remarkable Brazilian architects in the 20th Century was Italian émigré Lina Bo Bardi (born Rome 1914–died São Paulo 1992).

This article first looks at the regional diversity in modern Brazilian architecture and then at the ways in which Bo Bardi's sustainable and socially-conscious design is informed by regionalism. Regions are defined through their local materials, tectonics and particular typologies, and the architectural character defining regional spaces, in turn, shapes, retains and enhances social identity. It is timely to reassess the diverse work of Bo Bardi within Latin-America's modernism. Arriving in Brazil in 1946, Bo Bardi was, as well as an architect, a furniture designer, urbanist, political activist, writer and curator.

Previous studies have sought to identify the architects and theorists involved in the making of the modern cultural identity of Brazil, and the mechanisms that created such identity, from Lucio Costa to Oscar Niemeyer. Bo Bardi's work marks the beginning of sustainable design within Brazilian modern architecture; especially the adaptive re-use projects in Salvador, Bahia, identify the beginning of a new approach to heritage and urban renewal.

Therefore, in this article I ask: what exactly is the contribution and role of the work of Bo Bardi in Brazilian modernism? And: discussing regional identity in the Brazilian context, how is such local character expressed?

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1. Introduction

The generally high quality of modern architecture in Latin America in the 1940s, in countries like Brazil and Mexico, but also for instance in Venezuela, Uruguay and Chile, is striking. These works of remarkable vitality deserve the same acknowledgement as the works completed during the same period in the US or Europe (Hitchcock, 1955). During the last century, Brazilian cities were built with a generous emphasis on quality public space and lush parks and gardens. Reyner Banham pointed out that Brazil was the first country to create a 'national style of modern architecture' (1962, p. 36). Brazil is a vast country with a variety of regions (as different as tropical Bahia in the northeast to the dry Matto Grosso in the centre), all with different climatic zones and histories of settlement. In the warm climate, architecture doesn't need much insulation or complicated heating enclosures – one can live with

nature for most of the year. Consequently, modern architecture in Brazil has adapted many facets, from its first emergence in the postcolonial – indigenous and Portuguese – context around 1930 with the pivotal, heroic works of Lucio Costa (1902–1998), Gregori Warchavchik (1896–1972) and Rino Levi (1901–1965) – often called “the first generation of modern Brazilian architects” (Lehmann, 1998; 2004), still occupied with the construction of a particular national 'Brazilian style' – and the fascinating, flamboyant buildings by Affonso Eduardo Reidy (1909–1964) and Oscar Niemeyer (1907–2012) in Rio de Janeiro, to the highly individual works of Lina Bo Bardi and João Vilanova Artigas (1915–1985) in São Paulo and Salvador. Warchavchik's own small house in São Paulo (1928) is often described as the beginning of modern architecture in Brazil, while the end of classical modernism is seen with the completion of the new capital Brasília in 1960.

Two early important surveys of Brazilian architecture were written and published outside the country by the Museum of Modern Art in New York: in 1943, Philip L. Goodwin's *Brazil Builds*

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(the first exhibition and book that introduced Brazilian architecture to the world, as a regionalist movement) and, twelve years later, Henry–Russell Hitchcock's *Latin American Architecture since 1945*.¹ The publication of *Brazil Builds* was a particularly crucial moment, setting the benchmark for criticism of Brazilian architecture for many years to come (Artigas, 1997; Deckker, 2001). In fact, it took a long time for the first publication written by a Brazilian to come into being: until 1956, when Henrique Mindlin's *Modern Architecture in Brazil* finally appeared. However, to catch up with international trends, it is understandable that, at a certain point, the Brazilian people began to feel the need to reflect on their national traditions and identity, and reassess what they might contribute to an international discourse. Figs. 1–18.

2. The blossoming of Brazilian architecture

The history of architectural modernism in Brazil is one of exchanges, transfers and crossovers with the developed world. After its arrival in the 1930s, modernism quickly flourished in Brazil, and this led to its climax in the construction of Brasília, the new capital that was – despite being so far away from Europe – built in the hinterland strictly to the urban zoning principles as advocated by the Congrès Internationaux d'Architecture Moderne (CIAM) and the 1933 Athens Charter. The reasons for such an intensive and rapid blossoming of modern architecture in Brazil were threefold: firstly, the good economic conditions accompanied by a significant building boom (new university campuses, for instance, were a result of this boom); secondly, the extreme growth in population and urban development, causing major social transformations (in the twentieth century Brazil's population grew from 17 to 170

million, fuelled partly by high levels of immigration, requiring the construction of large public buildings); and, finally, the clear wish to overcome colonialism and build in a modern, contemporary style. Combined, these factors fostered a new, optimistic identity for the future of the country – which was also supported by politics, such as Getulio Vargas' politics of the *Estado Novo* (new state) – and created a climate of renewal and optimism that helped vanquish the colonial past, the Portuguese baroque and the previously dominant French style of the nineteenth century (Acayaba & Fischer, 1982; Cavalcanti, 2003; Kamita, 2000).

2.1. The shift from Rio de Janeiro to São Paulo

The city of Rio de Janeiro was the capital of the 'Old Republic' (which lasted from 1889 to 1930), whereas São Paulo was – from the 1950s on – clearly identified as the new financial, industrial and cosmopolitan centre of the country, despite never being its capital city (Evenson, 1973). The Arts Biennial for instance (starting in 1951) put São Paulo at the forefront of cultural activities. Most previous studies have concentrated on the era that can now be called 'the golden years of Brazilian architecture' (which ended around 1955), focusing mainly on the monumental Modernismo Carioca developments in Rio, Belo Horizonte and Brasília. This much-published 'free-form modernism' of Reidy and Niemeyer is usually identified as a 'uniquely Brazilian' architectural language (Andreoli and Forty, 2004; Costa, 1995; Niemeyer, 2000; Papadaki, 1950;). In addition to that, there were also other significant differences between the systems of two cities: for example, architectural education in São Paulo included major elements of engineering, and *engenheiro-arquiteto* (architect-engineer) was



Fig. 1. The Portuguese Baroque architecture of Minas Gerais, such as in Ouro Preto, evolved in the early eighteenth century as a consequence of the gold rush and Brazil's period under Portuguese colonial rule. (Images: S. Lehmann, 2008).

¹ Under Alfred Barr, Philip Johnson and Sigfried Giedion the MOMA defended the International Style and launched anti-regionalist campaigns. Much later, around 1955, MOMA suddenly became a supporter of regionalistic interests, thanks to Lewis Mumford and Bernard Rudofsky.

the title given at the Polytechnica in São Paulo, as opposed to the artistic training at the Escola Nacional de Belas Artes (ENBA) in Rio. This is the reason why Paulista School (Escola Paulista) modernism



Fig. 2. The Portuguese Baroque architecture of Minas Gerais, such as in Ouro Preto, evolved in the early eighteenth century as a consequence of the gold rush and Brazil's period under Portuguese colonial rule. (Images: S. Lehmann, 2008).



Fig. 3. Gregori Warchavchik's own house, Casa Modernista, in Itapopolis Street in São Paulo (built 1927–28), marks the beginning of modern architecture in Brazil.

mostly followed a more rational, simple approach, favouring an engineering-oriented architecture with an economy of means and



Fig. 4. The first generation of modern architects in Brazil, Lúcio Costa and Gregori Warchavchik, hosted Frank Lloyd Wright in 1930; however, Wright's visit was of much less impact than Le Corbusier's visit to Rio de Janeiro in 1936. (Images: Archiv Fondation Warchavchik, Sao Paulo).

an exposed concern for structural logic, often expressed in rough concrete (Artigas, 1981; Lehmann, 2004). With the focus on São Paulo, we can therefore observe a shift in the architectural paradigm, the transformation from the so-called Modernismo Carioca to Brutalismo Paulistano.

2.2. The Corbusian influence: curtain wall, brise-soleil and pilotis

There were strong 'regional' tendencies in Le Corbusier's ideology: a clear reference to the 'Mediterranean vernacular' (cubic form and white walls), which was just as prominent in his work as the idea of the machine or industrial standardisation. Thus, Corbusier's early work is rooted in the Mediterranean, Greek vernacular, with its white, cubic, essentially simple architectural language, clearly inspired by the architecture of the Cycladic Islands (Giedion,

1941). So there is a case for saying that the 1930s was not just the triumph of rationalism (as it often seems) but it was, simultaneously, the era of regionalism. Interestingly, Le Corbusier's Maisons Jaoul (completed in 1955) were built with a similar, almost medieval, level of technology, in direct opposition to the earlier ideas and beliefs of the classical, white Modern Movement: the buildings were reduced to Catalan vaulting, exposed brickwork, and rough concrete surfaces that revealed the timber shuttering. Such inquiries into simple moulding of mass were more easily adopted by Brazilian architectural thought than the pure glass structures of Mies van der Rohe's International Style – given that, for reasons of rapidity in construction and low labour costs, reinforced concrete had established itself as the construction material par excellence. With the easy availability of reinforced concrete, the growing demands of municipalities for large new infrastructure



Fig. 5. The headquarters for the Ministério da Educação e Saúde (Ministry of Education and Health, MES) in Rio de Janeiro (built 1936–43). (Images: courtesy David Bank, 2013)



Fig. 6. The headquarters for the Ministério da Educação e Saúde (Ministry of Education and Health, MES) in Rio de Janeiro (built 1936–43). (Images: courtesy David Bank, 2013)

and buildings could be met in a short amount of time. Concrete became the typical, characteristic material in all Brazilian regions (Lehmann, 2014).

Building materials rarely travelled by plane, but many European architects did, and their ideas and building techniques came with them. When Le Corbusier had little to build in France, he visited countries like Algeria (1931), Brazil (1929 and 1936) and Argentina (1929) in the hope of attracting commissions, and he gave a series of lectures on his 'principles' (Le Corbusier 1930). His architectural principles, being the functional independence of skeleton and wall

– the 'plan libre', the free façade with the introduction of the curtain wall and brise-soleil, the roof garden and the piloti – all soon became standard vocabulary for Rio's architects. These were the same principles that were used in the construction of the Ministry of Education and Public Health (MES) under Lucio Costa's leadership, marking a breakthrough for Brazilian modernism, which was much more independent of Le Corbusier than some of the frequently quoted European literature and publications by Le Corbusier would suggest.

In 1936, the young architect Lucio Costa was appointed by



Fig. 7. Typical for the Paulista School: building for the architecture and urbanism college (FAU) at the Universidade de São Paulo, by João Batista Vilanova Artigas (built 1961–65). (Images: S. Lehmann, 2008).



Fig. 8. Typical for the Paulista School: building for the architecture and urbanism college (FAU) at the Universidade de São Paulo, by João Batista Vilanova Artigas (built 1961–65). (Images: S. Lehmann, 2008).

Education Minister Gustavo Capanema as the architect of the new headquarters for the Ministry of Education and Public Health in Rio de Janeiro. By 1939, the team of architects responsible for the project consisted of Lucio Costa, Carlos Leão, Affonso Eduardo Reidy, Jorge Moreira, Ernani Vasconcellos and Oscar Niemeyer, with Le Corbusier acting as a consultant. It was the first public-commissioned and state-financed modernist skyscraper in the world and on a much larger scale than anything Le Corbusier had

built up to that point (Costa, 1995).

Oscar Niemeyer (1907–2012), apprentice to Lucio Costa, was to emerge as one of the most important Brazilian architects, well-known for his design of civic buildings for Brasília, the planned city that became Brazil's capital in 1960; as well as his collaboration with other architects on the United Nations Headquarters in New York City. His exploration of the aesthetic possibilities of reinforced concrete was highly influential in the late 20th century.



Fig. 9. The new capital, Brasília, a functionalistic, completed in 1960. While the master plan was designed by urbanist Lúcio Costa, most buildings were designed by Oscar Niemeyer. (Courtesy the Arquivo Público do Distrito Federal).

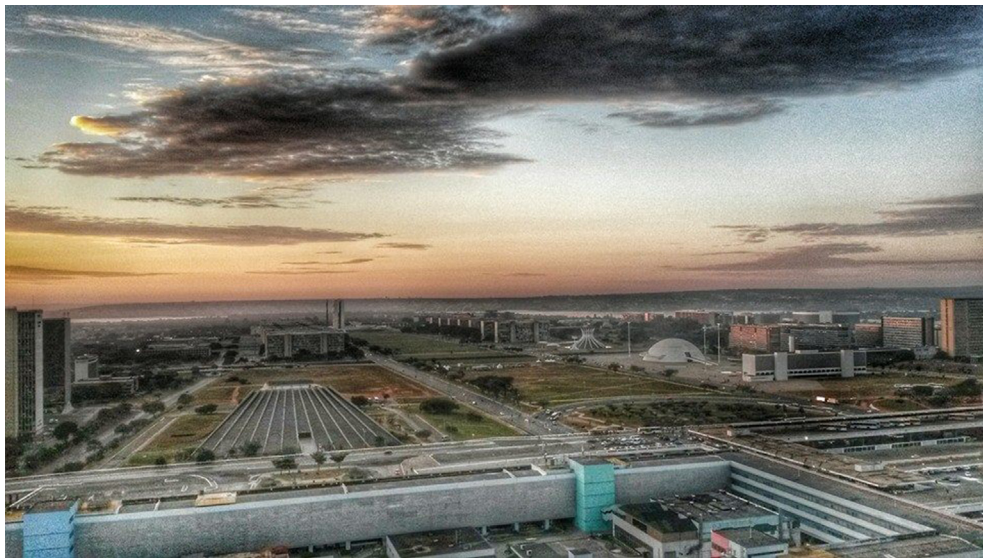


Fig. 10. The new capital, Brasília, plano piloto (pilot plan) by Lúcio Costa, winning entry to the urban design competition, March 10, 1957. Costa envisaged Brasília as an aircraft seen from above. (Courtesy the Arquivo Público do Distrito Federal).

3. Architectural production and cultural identity

Brazil has been particularly privileged with regard to the Modern Movement in two important ways. In the first place, the influx of immigrants introduced an openness to and acceptance of the cubic, orthogonal compositions of European modernism at an everyday level. There was little resistance to the foreign, the imported (Lara, 2008). One may claim that Rio de Janeiro (always more French influenced) and São Paulo (more Italian in immigrant population and character) are both cities where, until today, a normative modern 'international' architecture has accounted for a

large part of the urban fabric. In the second place, Brazil is blessed with a warm climate for most of the year, and this, together with the varied topography of its cities, has had a mediating influence on modern abstraction. Indeed, this combination meant that modern structures could be simply detailed to withstand the climate, but they often had to be modified in order to accommodate themselves to the varying topographical contours and slopes of any given site.

3.1. The globalizing influence of international modernism

The discussion about 'identity' in architecture is closely

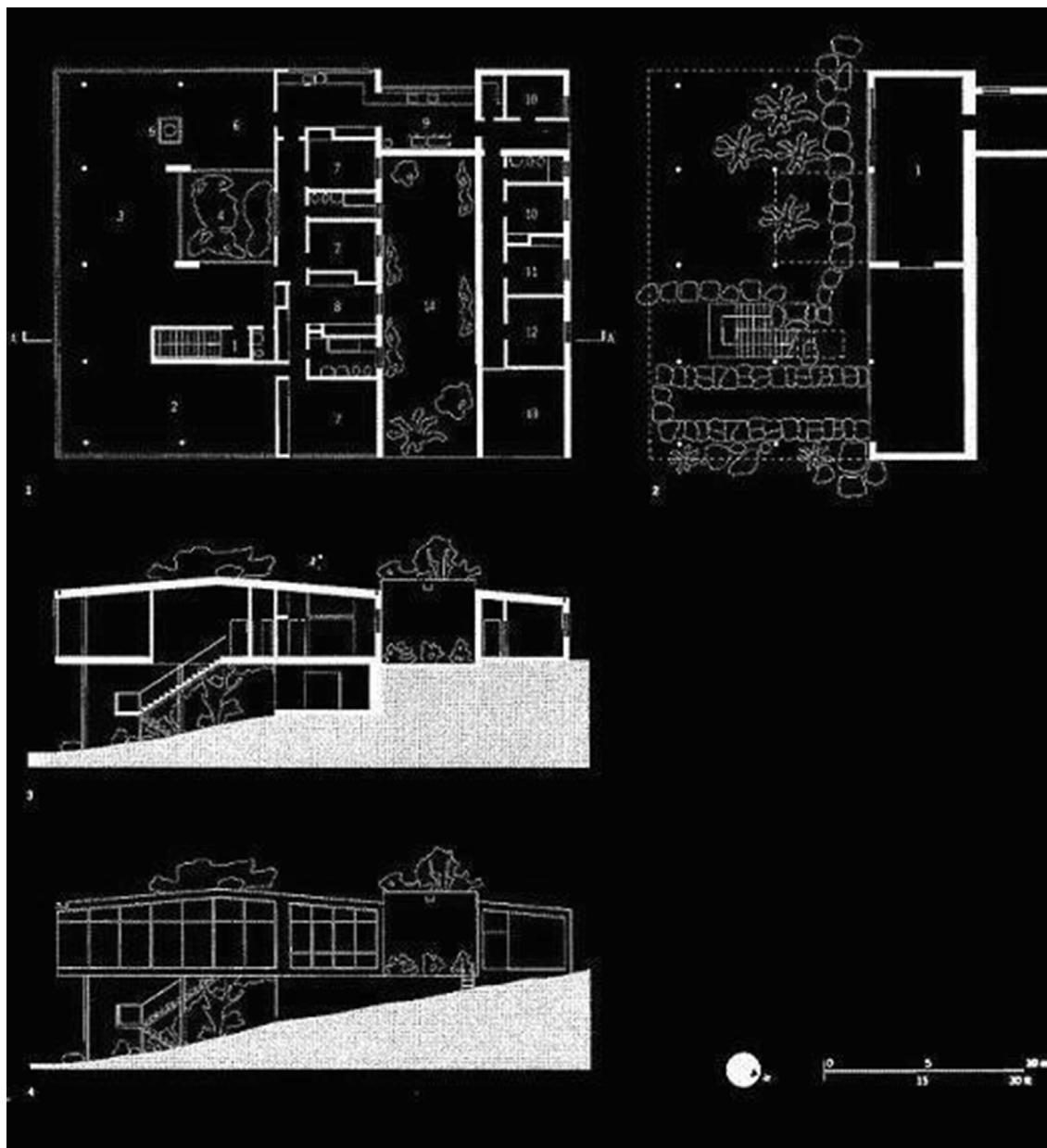


Fig. 11. The Casa Vidro ('Glass House', 1949–51): Bo Bardi's own house in São Paulo, a modernistic, white typology with a central courtyard. (Courtesy: Instituto Lina Bo e Pietro Maria Bardi).

connected with the question of regionalism. The three theorists of regionalism, Kenneth Frampton, Alexander Tzonis and Liane Lefaivre, used the word 'critical' in order to distinguish their regionalism from romantic forms that had previously existed, particularly the 1930s *Heimatstil* (homeland style) of the Nazis in Germany. Bo Bardi, however, could never be tied to an architectural movement. 'Movements can be construed as reactions to rationalist shoe-box architecture,' she wrote in a 1967 essay on South America after Le Corbusier. While Frampton sees regionalism as an antidote to cosmopolitan modernism and globalisation, Bo Bardi merges modernism with regionalism and the vernacular, melting it in her personal project of reclamation.

Today, there is a need to re-address and re-define the notion of 'critical regionalism'. Referring to Gottfried Semper's writings, architectural historian Alan Colquhoun remarked that, ever since the early nineteenth century, one of the main directions of

architectural criticism has been regionalism (Colquhoun, 1997; Semper, 1860). Like Semper, Colquhoun has been preoccupied with finding a theoretical basis for the relationship between construction, place and architectural language. According to this approach, architecture should always be firmly founded on specific regional practices, based on climate, the availability of local materials, craftsmanship and local building traditions. Throughout the twentieth century there was a power struggle and intellectual friction between regional influences and the abstract, rational beliefs of purist modernism – and this is particularly evident in Brazil.

The globalising forces of international modernism are believed to have eliminated differences, obliterated individual identities and led to more homogeneous architectural forms. Thirty years after



Fig. 12. The Casa Vidro ('Glass House', 1949–51): Bo Bardi's own house in São Paulo, a modernistic, white typology with a central courtyard. (Courtesy: Instituto Lina Bo e Pietro Maria Bardi).



Fig. 13. Museum of Modern Art São Paulo, MASP (1957–68), the building as a super structure — hanging from 4 massive pilotis — covering a public space. Today, it is hard to believe that this abstract project is by the same architect as her later works. Lina Bo Bardi's MASP museum introduced a new monumentality in São Paulo's public architecture; raising the building from the ground is all about creating a public space at street level. (Photos: S. Lehmann, 2008).

² In conversation with the author (Berlin, December 2004), Liane Lefaivre pointed out: "Regionalism has been around for a long time. Vitruvius was the first to mention Regionalism. Since the Renaissance we can call Regionalism critical."

Lefaivre and Tzonis introduced the term, and Frampton later popularised it, the term 'critical regionalism' has become commonplace in architectural debate.² At first glance, it would appear that



Fig. 14. Museum of Modern Art São Paulo, MASP (1957–68), the building as a super structure – hanging from 4 massive pilotis – covering a public space. Today, it is hard to believe that this abstract project is by the same architect as her later works. Lina Bo Bardi's MASP museum introduced a new monumentality in São Paulo's public architecture; raising the building from the ground is all about creating a public space at street level. (Photos: S. Lehmann, 2008).

international modernism was always the counterpart to critical regionalism. But isn't counter-posing regionalism and modernism a limited view, overly simplistic and a false dichotomy? Frampton himself mentioned in 1983 that a regionally inflected, yet critical form of modern architecture had been in existence the entire time, evolving in parallel to the avant-garde movement (Frampton, 1983). It seems that what is usually presented as a single idea, called 'critical regionalism', is in fact an oversimplification of a complex of different simultaneous tendencies – the interplay between international modernism and regionalism. This is also obvious in Lina Bo Bardi's buildings in the 1960s and 70s, built precisely during the time of the global introduction of modernist stereotypes, but expressing a certain resistance against an uncritical adaptation.

Of course, we have to keep in mind that architects, as creators of 'constructed identities', have only limited power to shape society by adding to cities. Peter Herrle has written extensively about the loss of regional identity and its association with the built environment, noting: "The loss of local coherence and identity is something that cannot be counterbalanced by just one professional group (the architect). Identities in architecture have always been a blend of different streams amalgamating in a given culture at a given point in time. He points to the fact that identities in architecture are being 'made and constructed', and do not only depend on cohesiveness and a system of shared values; diversity is part of the pattern of local architecture, and plays an important role in the making of identity.

3.2. From 'critical' to 'dynamic' regionalism

In our search to identify the 'local' and the 'foreign', we need to focus on the 'identity attributes' in architecture. The dynamic transfer of ideas – like transcultural injections from outside – and the importation of European culture, such as classical modernism, into emerging countries such as Brazil, Mexico or India, is generally a challenging phenomenon. Ironically, the importation of avant-

garde ideas into the developing world produced a new synthesis which was reflected back to Europe shortly afterwards, following a regional reshaping of newly arrived ideas from the Bauhaus, through local conditions, into something quite different and unique. The impact of immigration is important in understanding the Brazilian condition: the importation of architectural ideas inevitably creates contextualised hybrid forms, products of foreign importation melting with local forms and traditions. Alongside the 'foreign' and the 'own' there is a third category, the 'adapted foreign', leading to new constructed identities (Herrle, 2008).

So modern Brazilian architecture was not just the simple triumph of avant-garde ideas arriving in Latin America, as often described in the literature, but a dynamic evolution with crossovers and hybridisation. I suggest, therefore, that the well-known, but usually oversimplified, debate about international modernism versus regionalism should be adjusted. This is why I advocate the introduction of the term 'dynamic regionalism', which better expresses the 'lively mixing' of imported and local elements.

Regional architecture becomes a dynamic manifestation of new and developing ideas through hybridisation and integration (a working method also described by Bernard Rudofsky in 1964 in *Architecture without Architects*). Regional forms are often seen as conservative manifestations of static cultural traditions that are maintained from one generation to the next, lacking innovation. However, in the case of Lina Bo Bardi's work, regional architecture is the result of dynamic forces, the outcome of a process of integration of diverse cultural, environmental, social and technological influences. Just as a simplistic binary that opposes modernism and regionalism would be wrong, it would also be incorrect to say that Bo Bardi was first a modernist and then became a regionalist. As we know from her own writings, he has clearly been thinking about these ideas for many years before putting them into her practice, and, even then, there is a melange of modernist and vernacular approaches.



Fig. 15. Cultural and sports centre SESC-Pompeia, São Paulo (1977–86), making use of a former factory and extending it with a 'beton brut' tower. Lina Bo Bardi also designed the simple timber furniture; a sensitive adaptive re-use of the former glass factory into a highly popular community place. (Photos: M. Ferraz, 1993; S. Lehmann, 2008).

4. An identifiable regional school?

In the 1950s, the International Style was starting to give place to a highly form-dominated trend, which the historian Juergen Joedicke (1979) called 'international brutalism'. This style was mainly inspired by the post-war work of Alison and Peter Smithson (British Brutalism) and Team X, and again, of Le Corbusier – especially his *Unite d'Habitation* in Marseilles (built 1946–52), and later the government buildings in Chandigarh. It flourished with particular vigour in Britain, Japan and the Netherlands. It used rough off-form concrete in a highly plastic manner. In 1955, Hitchcock wrote about the simple construction material that 'the characteristic and almost exclusive building material in Brazil is simple concrete, reinforced in various ways, the structural shell filled in with rubble or more usually with low-grade tile or brick and sometimes covered with painted stucco' (p. 23).

Around the same time in São Paulo, an identifiable regional school emerged, the 'brutalismo Paulistano', which is more than just a South American version of British brutalism (interestingly, Vilanova Artigas always denied any influence from British Brutalism). As previously mentioned, concrete was widely accepted by the public and could be used easily and affordably by employing untrained, inexpensive labour and using local cement, which was available in abundance.

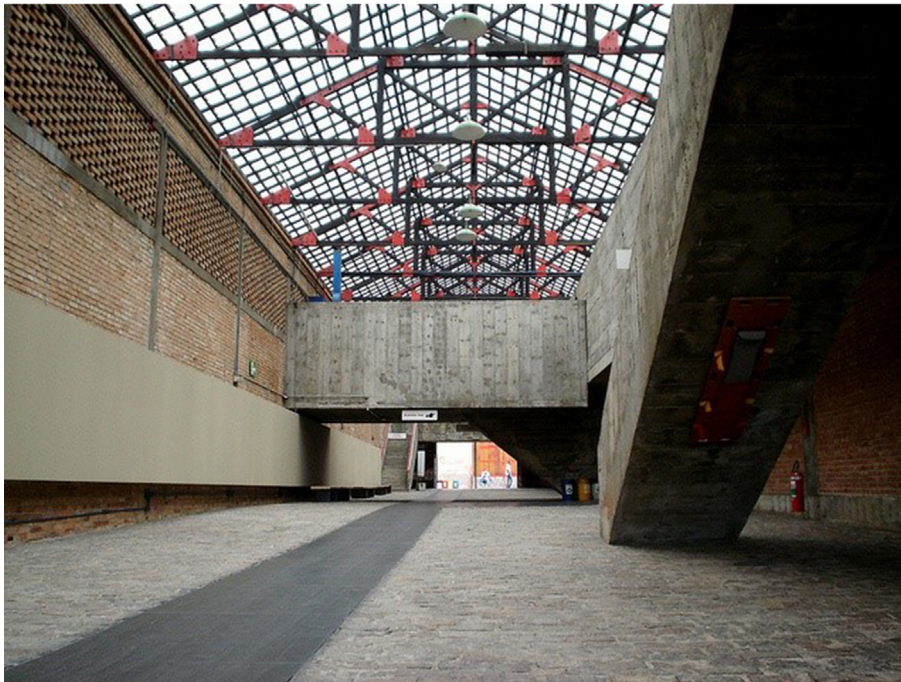
As Frampton pointed out, the idea of 'critical regionalism' is

closely related in a specific way to the issue of the tectonic and to the 'poetics of construction' (Frampton, 1995). The use of concrete 'in-situ' is a 'one-off' structural invention built into a unique site, using locally available know-how and methods to assemble the formwork. This became a characteristic feature of the Paulista School; and it was more than just using the materials of the place: the 'school' of São Paulo also developed certain particular forms of expression of its own. Some other characteristics of this regional 'school' are: the use of local stones for the irregular stone walls at the building's base; a special focus on climate-responsive design, catching the breeze through cross-ventilation; the site-specific placement of the building in the existing topography; and the capacity for enrichment through craftsmanship, for example, the timber works in the façade and interior as in-fills. All these features are indicators of São Paulo's regional architecture.

Members of the Paulista School included São Paulo-based architects Vilanova Artigas and Rino Levi, but also less known architects Osvaldo Bratke, Carlos Cascaldi, Eduardo Kneese de Mello and Adolf Franz Heep (as well as the much younger Paulo Mendes da Rocha, born 1928) – all contemporaries of Lina Bo Bardi. While she was close to this prominent group – especially since completion of MASP in 1968, expressing the large-scale structuralist elements – Bo Bardi was never a member of the Paulista School. Instead, she always preferred to go her own path (Lehmann, 2014).



a



b

Fig. 16. a/b. Cultural and sports centre SESC-Pompeia, São Paulo (1977–86), making use of a former factory and extending it with a 'beton brut' tower. Lina Bo Bardi also designed the simple timber furniture; a sensitive adaptive re-use of the former glass factory into a highly popular community place. (Photos: M. Ferraz, 1993; S. Lehmann, 2008).

4.1. São Paulo's landscapes of modernisation

In the 1950s, Brazilians watched the creation of their new capital Brasília – without doubt one of the most utopian projects of the Modern Movement – and witnessed the rapid transformation of Brazil's cities, while large parts of the population still lived in precarious accommodation and poverty. The development of architecture at that time was particularly bound to the private single-family house, belonging to the new, emerging entrepreneurial middle-class that began to flourish in the late 1950s following the

economic boom. Some of the architects' houses (including Bo Bardi's own Glass House, 1949–51) re-elaborated the traditional courtyard lay-out, incorporating carefully selected local plants, while others elaborated solid–void relationships in an almost sculptural manner. The *Casa de Vidro* (Glass House) was still in a modernist style and influenced by Italian rationalism, keeping up with the international trend; the house sits on slender circular columns, which allows the lush landscape to flow under the building. Other houses built in this era in the US included modern villas known to Bo Bardi from publications, such as: Farnsworth



Fig. 17. Projeto Barroquinha, Salvador (built 1986–87), a renovation project in the run-down Baroque city center, by Lina Bo Bardi in collaboration with the musician Gilberto Gil. It includes the adaptive reuse of Casa do Benin and Casa do Olodum, both Bahian-African cultural centers. (Courtesy: Instituto Lina Bo e Pietro Maria Bardi; S. [Lehmann, 2008](#)).



Fig. 18. Restaurante Coati, Ladeira da Misericórdia, Brazil (built 1990), by Lina Bo Bardi and João Filgueiras Lima. (Courtesy: Instituto Lina Bo e Pietro Maria Bardi; S. [Lehmann, 2008](#)).

House by Mies van der Rohe, 1950; the Case Study House No. 8 by Charles and Ray Eames, 1949; and the Glass House by Philip Johnson, 1948. The plans of all these houses were published widely

around the time when Lina Bo Bardi and her husband were planning their own new house.

Regional architecture and identity is always the result of

dynamic forces, the outcome of a process of integration of diverse existing cultural, technological and environmental influences, where outside influences and innovation have their impact diluted by local conditions. In this way, Brazilian dynamic regionalism distanced itself from the naïve utopianism of the early heroic Modern Movement, while the buildings responded pragmatically to the specific conditions of the tropical climate and the harsh light.

4.2. Lina Bo Bardi: a Paulista architect rejects Rio's manneristic 'free-form modernism'

An Italian immigrant, Bo Bardi became increasingly concerned about the erosion of Brazilian culture and identity through the process of modernisation in her adopted homeland. Born in 1914 in Rome, in 1946 Bo Bardi immigrated to Brazil, then a young nation without the ruins found in post-war Europe, with her husband (the respected art historian Pietro Maria Bardi, who she had married in the same year). Bo Bardi and her husband moved to São Paulo, despite her preference for Rio de Janeiro. In 1951 she became a naturalised Brazilian citizen. She died in 1992 in São Paulo. Prior to leaving Italy, Bo Bardi worked with Gio Ponti (1891–1979) in Milan and was the editor of an interior magazine. Ponti was a good role model, as he was an equally prolific, multi-faceted designer, architect, writer and curator, and founding editor of the design magazine *Domus*; like Bo Bardi, Ponti could not easily be pinned down to one discipline or style, but was deeply committed to the promotion of the social and cultural potential of architecture. In 1946, when Mussolini's era came to an end, Pietro Maria Bardi was appointed museum director of São Paulo's Museum of Modern Art (MASP), entrusted by Brazilian tycoon and philanthropist Assis Chateaubriand to build up a new collection of art for the museum.

Lina Bo Bardi, one of the most important architects working in Latin America in the 20th century, was 'remarkably prolific and intriguingly idiosyncratic in her intellectual engagement with modern architecture' (De Almeida Lima, 2013). After arriving in São Paulo and adopting Brazil as her home country, Lina soon fell in love with the regional culture of Northern Bahia and learned to appreciate the colonial architecture ('discovering the true Brazil', as she used to say – quoted after Marcelo C. Ferraz). From 1959 to 1968, she moved to Bahia and spent most of her time in Salvador, renovating and adaptively reusing several baroque buildings, which is often described as the beginnings of heritage conservation in Brazil (SPHAN, the Brazilian equivalent of the National Trust, was founded in 1936 by Lucio Costa and others). Describing her work as 'anchoring modernism in the region', she organised numerous exhibitions of Bahian cultural artefacts. In her own home, the 'Glass House', she lived with her husband in the midst of an eclectic collection of locally found objects and artefacts, surrounded by lush nature and the intense Brazilian light that creates a unique atmosphere. During this time, she arguably became 'more Brazilian' than the Brazilian people themselves.

Verde Zein wrote about this time: 'Bo Bardi helped transform the still provincial panorama of São Paulo, organising exhibitions, editing an art and architecture magazine and designing some of the most significant works of Brazilian architecture, such as the MASP museum and the SESC cultural centre. From 1957 on, attention in Brazil and internationally was focussed on the new capital: the significance of Brasília as a real-life utopia and the shock impact of the modern ideals, which it proclaimed and embodied, are indispensable factors for an understanding of the subsequent evolution of Brazilian architecture and its progressive distancing from the currents of international debate from the sixties on' (Zein, 1998, p. 14–18).

5. The late works of Bo Bardi: the multiplicity of local character, meaning and regional identity

In Bo Bardi's works we find acceptance of regional construction methods as one mode of expression to handle the varied topography, introducing ground floor walls with expressive, irregular stonework and the total exposure of structural elements above (e.g. the exaggerated concrete super-frame of the MASP, where the structural frame defines the entire aesthetics of the building). Her work reveals a range of architectural languages, and here, such diversity can be seen as a pattern of local influences. Interestingly, her work had an internal principle-based consistency and was always engaged in a self-restricted series of ideas that was carried over from one project to another and transformed in the process; while her architectural language continually evolved, and this evolutionary aspect is extremely important. For instance, constructional form and material character were integral to an evolving expression in her architectural work. She was adept at the use of off-form, exposed concrete and the bold simplification of large-span structural ideas. Large concrete structures were common in Brazil from as early as the 1930s building boom, as there were no steel mills at that time. The way in which the architectural elements – such as concrete walls, columns and beams – were articulated by Bo Bardi from one work to the next provides a basis upon which to evaluate her work as a whole. She was concerned with the specific appearance of the structural elements, and thus she re-interpreted in concrete the regional tradition of simple articulation of the wall surface (just as in the Maisons Jaoul).

Lina Bo Bardi became increasingly disillusioned with functionalism at the height of her professional career, and after visiting the much anticipated completion of the new capital, Brasília, in 1956 (Ferraz, 1993; Bo Bardi, 2012). Questioning such mega projects and the possibility of building a new city from scratch, she refused to follow the trend of an over-articulated application of technology as a means of perpetuating an inherently wasteful consumer society. Climatic conditions have often been explored as the impetus underlying regional aspects of architecture. While still adhering to functionalist principles in terms of the general layout of the plan, she started to indulge in shallow-pitched roofs and random walls made of local stone, paying attention to principles of natural cross-ventilation and thermal comfort. At the same time, she remained unequivocally committed to the revelation of twentieth-century building technology: the reinforced concrete skeletal frame and its infill sun screening or shutters, with a strong interest in social aspects and low-cost housing systems.

Bo Bardi's output, while small, is significant because of her importance as an architect who respected regional cultures, which became the main drivers of her later works in Salvador; she nurtured a diversity of design approaches, making every project unique and outstanding (even if simple in its gesture), rather than producing a large number of repetitive projects; her experimental approach ranged from daring construction technology (e.g. the large-span superstructure of MASP in São Paulo; with its 8 m high and 70 m wide public space), to small-scale experimentation with concrete formwork (e.g. the adaptive re-use projects in Salvador, Bahia), to careful restoration of heritage buildings (taking the heritage focus of Lucio Costa further into mainstream Brazilian architecture), thus opening up an alternative way into modernism that makes Brazil such a unique case.

5.1. Working within regional characteristics

Thus, while Bo Bardi had initially participated in the explorations of the modernist generation, she subsequently became a central representative of the critical regionalism approach. Like Luis

Barragan or her Brazilian colleague Vilanova J. Artigas, she refused simply to surrender to European abstract modernism à la Bauhaus; rather, she tried to modify it by bringing in the regional character. As a result, her work was not based on sentimental vernacular or folkloristic elements. Comparable to Barragan in Mexico City, Bo Bardi is an example of an architect working with the specific characteristics of the particular places and cities, including the common, ordinary and 'everyday', thus creating a language of sustainability. She immersed herself in writing, both culturally and politically, and architectural writing became highly significant to her development as an architect; in fact, she wrote more than she built. For instance, in 1947 she began editing the journal of the São Paulo Museum of Art, *Habitat*.

Her early works – like the *Casa de Vidro* (House of Glass, 1949–51) or the Museum of Modern Art in São Paulo (1957–68) – were still in a modernist style, keeping up with the international trend. Thereafter, Lina Bo Bardi's work became increasingly inflected towards the vernacular, influenced by the African slave culture of the North Brazilian people in Bahia. Bo Bardi developed a passion for locally rooted culture and for popular, folkloristic art; she wanted to 'brasilianise' the architecture. For her, 'the truth in the vernacular lay forever beyond time because nobody could determine its age' (BoBardi, 1995). In her writings of this time, she promoted the social and cultural potential of architecture and design, and proposed new parameters for design thinking on adaptive re-use, which included her notions of 'historical roughness' and 'tolerance to imperfection'. She wrote: 'We cannot accept, however, that Brazilian architecture is already on its way towards academism, as various foreign views would have it, and nor will it be, for as long as its spirit is in the human spirit and its goal is the improvement of living conditions – for as long as it draws its inspiration from the intimate poetry of the Brazilian land. These are the values that really define contemporary Brazilian architecture'³ (first published in the journal *Habitat* 2, January 1951).

The project that most clearly exemplifies Bo Bardi's break with modernism is probably the cultural centre SESC Pompeia (1977–86) in São Paulo: this adaptive re-use and extension of a former glass factory was environmentally sensitive and poetic at the same time, creating an assemblage and topography of old and new. There are various scales of intervention but the 'new' is always respectful of the existing buildings and structures, designed with great precision and without imitation. Here, Bo Bardi's experiments with reinforced concrete, beton brut, continued. Being deeply committed to the social and cultural potential of architecture, SESC Pompeia illustrates the power of architecture as 'an agent of social change', supporting residents of a poor neighbourhood with cultural and sports facilities, maintaining the identity, memory and history of place through careful adaptive reuse and extension. In today's discourse, this is something we would call 'sustainable'.

6. The link between adaptive reuse and sustainability

Modernity and sustainability are closely intertwined in the challenge of creating better places to live and work. The existing built fabric can represent a high value that offers a resource in terms of social, economic and environmental sustainability. In general, there is an opportunity and duty to preserve the existing fabric and reuse buildings which have lost their original function, which are physically obsolete, or which no longer meet today's ever-more demanding standards. In fact, it is part of the contemporary agenda of urban renewal to reuse material and space, realise

spatial and functional transformations and update regulations concerning fire, user safety, energy efficiency and environmental comfort.

With the introduction of lifecycle assessment, the link between the adaptive reuse of existing derelict buildings with sustainability has become much better understood, and the positive environmental and social impacts that can result from such conversions of existing buildings, beyond its sheer heritage value. The cases in Salvador and São Paulo are useful here, as the adaptive reuse projects of Bo Bardi reduced the negative impact on the environment and the depletion of non-renewable resources.

In 1973–74, the challenge of the ecological crisis emerged as a new issue, following the first *Oil Crisis*, and the publication of the pivotal book *The Limits to Growth* (Meadows, Meadows, Randers, & Behrens, 1972); both had many short-term and long-term effects on global politics and the economy, and generated a fervent debate (also between Brazil's intellectual circles). *The Limits to Growth* revealed that unlimited growth was impossible, given finite resource supplies and population growth, marking a time when the ecological architecture movement emerged.

Adaptive reuse refers to the process of reusing an old existing building or site for a purpose other than which it was built or designed for. Until today, the urban dimension of Bo Bardi's work in Salvador and São Paulo has not been sufficiently appreciated. Besides her social approach, there is also a strong environmental position that laid the foundation of sustainable urban renewal in Latin America; and Bo Bardi's sustainable and socially-conscious design method is directly informed by regionalism. In addition, it's a strategy that retains the embodied energy of the existing urban fabric and exemplifies the cultural significance of these structures: keeping the existing buildings maintains the cultural identity and exemplifies the tectonic evolution of the vernacular architecture (Lehmann, 2016).

Bo Bardi's adaptive reuse of existing buildings therefore marks a paradigm shift in thinking about historical structures in Brazil and the commencement of renovation as eligible strategy for entre urban precincts. This was an entirely new paradigm, as the previous period of Modernism usually started with a 'clean slate', after the complete demolition of the existing old fabric to make space for the new (Giedion, 1941).

Following her early modernistic and structuralistic works, such as the *Casa de Vidro* or MASP Museum in São Paulo (both still inspired by the International Style and Structuralism), the late thoughtful work of Bo Bardi is of an entirely different quality: recycling, up-cycling and adaptive reuse is applied as an urban design strategy where the *New* sits comfortable side-by-side with the *Old*, without ever imitating the existing. Thus, Lina Bo Bardi created her own continuation between dynamic vernacular and the modern avant-garde (Lehmann, 2014, 142). In regard to the resourcefulness and reuse, Zeuler Lima notes that "Bo Bardi's social and ethical awareness, and her talent for making do with scant resources – honed during her native Italy's World War II devastation – speaks to our anxious, solution-seeking era" (2013).

From the rejuvenation of a disused, neglected barrel factory into a highly popular public cultural and leisure centre (SESC Pompeia in São Paulo, 1977–86), to the renewal of the historic Pelourinho district (the old Baroque centre of Salvador, 1986–92), such underutilized, abandoned or disused buildings and quarters are seen as a precious resource that can be transformed towards new usages and offer significant environmental and social benefits. Two cultural centres, Casa do Benin and Casa do Olodum (1987–89, both in Salvador) are good examples of the various specific restoration and reuse projects carried out as part of the rehabilitation of the historical centre, where new circulation systems and programs were carefully inserted into existing structures (De Almeida Lima,

³ Quoted from *Stones against Diamonds*, an anthology of writings by Lina Bo Bardi published in 2012 by Architectural Association Publications (London), p. 26.

2013). The insertions of new structures respect rather than mimic its historic setting.

Reuse, repurposing, recycling and remanufacturing have all entered our vocabulary. To reuse (e.g. a building) is to use an item or structure again after it has been used. This includes conventional reuse where the building is used again for the same function, and adaptive reuse, where it is used for a different function. In contrast, recycling is the breaking down of the used item into raw materials, which are then used to make new items. Thus, the most sustainable building is the one that already exists.

Adaptive reuse, also known as ‘up-cycling’ of buildings (or repurposing), is the process of taking disused buildings that are now unwanted for their original function and transforming them again into a useful building (this is different from recycling, where the building materials are broken down to their component parts and re-manufactured into new parts, such as walls or floors). Adaptive reuse is also different from conventional reuse, where the product is used in its original purpose again.

Bo Bardi's concept is quite simple: retaining as much of the existing building fabric as possible, working within the original envelope, providing new insertions such as staircases, to improve the circulation. Similar to today's Burra Charter, which recommends to do “as much as necessary, and as little as possible”: all new work is made to read differently from the existing fabric so that the important qualities of the building's past have been retained (such as the rich texture of the stonework and brick walls).

Through adaptive reuse of derelict, unoccupied buildings, these can become again suitable sites for many different types of use. Along with brownfield sites' reclamation, adaptive reuse is seen by many as a key factor in the reduction of urban sprawl and construction waste. The increasing waste generation from construction and demolition is a growing worldwide concern. Instead of demolition, extending the lifecycle of buildings through their up-cycling and reuse is right at the core of any sustainability concept.

7. Concluding remarks: careful urban renewal and other modernisms

The most relevant work of Lina Bo Bardi might as well be her late work, which introduced urban renewal and adaptive reuse of existing buildings to Brazil's derelict centres. With the careful renovation of an entire colonial district in Salvador, the Projeto Barroquinha (executed 1986–90), she inserted few new buildings (such as the Coafé restaurant) and adaptively reused existing structures in the run-down Baroque city center. Here, Bo Bardi collaborated with the musician Gilberto Gil and the French philosopher Pierre Verger. Highlights are the adaptive reused Casa do Benin and Casa do Olodum, both Bahian-African cultural centers with the insertion of spectacular new staircases.

While in her early work (before 1970) Bo Bardi was still concerned with introducing established modernist ideas into Brazil, in her later work we find a strong expression of an approach consistent with Carroll's point about the importance of local elements; Bo Bardi's later work (in the 1980s, starting with SESC-Pompeia) reveals how she had absorbed and was working with regional characteristics and elements of vernacular identity. Architects must focus on how buildings and cities really work, how the user fits into the picture, and how technical systems are integrated. Lina Bo Bardi's main contribution was to show architecture this alternative way of appreciation of vernacular cultures and the potential of adaptive reuse, while always respecting the diversity of opportunities.

Lina Bo Bardi was never part of the main group of architects in São Paulo, in fact she was not accepted into the ‘elite club’ of the University of São Paulo. When I met with Lucio Costa, Roberto Burle

Marx and Paulo Mendes da Rocha in the late 1980s, she was usually not mentioned in our conversations. Lina Bo Bardi was an outsider, interested in doing ‘her own thing’, and often described as prolific and non-conformist (Zeuler Lima 2013). She had a fascination with Brazilian folk art and popular culture particularly that of the country's heavily Africanized northeast, Bahia – at a time when her Paulista colleagues were still under the Corbusian influence (Le Corbusier 1930).

The importance and benefits of Bo Bardi's adaptive reuse projects, her strong engagement in the adaptive reuse of existing buildings (rather than in new-built construction), marks a clear paradigm shift in thinking about the historical context and colonial structures in Brazil and the commencement of adaptive reuse as an eligible strategy for sustainable urban renewal of the run-down Baroque city centres. In the 1970s, this introduced an entirely new approach in Brazil, as the previous period of heroic Modernism usually started with a ‘clean slate’, involving the complete demolition of existing old fabric to make space for the new.

From the rejuvenation of a disused barrel factory into a public leisure centre (SESC Pompeia in São Paulo) to the renewal of the historical Pelourinho district (the centre of Salvador, Bahia), such underutilized, abandoned or disused buildings and sites have been rediscovered as a precious resource that can be transformed towards new usages, and as a result deliver significant social benefits.

Sociologist Anthony Giddens argues that “the flipside of globalisation is a return to the local with a revival of long forgotten cultural identities and the vernacular” (1999, p. 86). There is a certain paradox embedded in the fact that an anti-globalist movement like regionalism is seeking to extend itself worldwide. I have examined the core of the question: how can local character be expressed in an architect's work? The concept of regionality “depends on it being possible to correlate cultural codes with geographical regions”, as Colquhoun (1997, p. 22) pointed out. But today, the traditional determinants – local climate, geography, craft traditions and religions – are rapidly disappearing and losing their importance. One conclusion that can be made is that regional identities, such as those belonging to São Paulo and Salvador, have been strong, dynamic influences on Bo Bardi's architecture, and today such regional influences are still evident and identifiable in some contemporary architects' works, resolutely withstanding the pressures of globalisation, which erodes national identity and regional characteristics in the built environment.

However, ‘critical/dynamic regionalism’ in Brazil is in a period of transition, and the simultaneous integration of theory and practice into a single discourse proves that interweaving can be fruitful. Regionalism's success has sometimes been ambiguous; its critical dimension is still a major influence, while its tendency towards sentimental nostalgia attracts conservatives. Regionalism has contributed to the maturing of architecture in Brazil; it has given it a sense of identity, which is always constructed; it never evolves naturally. The current revival of an interest in identity is the product of a sense of dislocation in a fast-changing globalised world. With the impact of globalisation since the 1980s, architecture in all countries has become more similar and national differences less recognisable (Zein, 2004).

Both tendencies, international modernism and regionalism, had an impact on the further development of Brazil's architecture and identity. The impressive spatial quality of Brazilian architecture has held its ground from one generation to the next, despite a regrettable regression into historicising, stylistic postmodernism in the 1980s. One attribute that stands out above all others is the truly subtle and rigorous planning ability of Brazilian architects; that is to say, their intrinsic capacity to organise and orchestrate large architectural space within master plans. The best example of this is the extraordinary work of Oscar Niemeyer, who died in 2012 and

was treated as a national hero during his lifetime.

The idea of a 'critical/dynamic regionalism' represented the idea of modernism adapted to its locality. Today, it can be seen as an attempt by a few architects to escape from the low point of global corporate banality and to re-introduce the idea of local building tradition, materials and typologies. Taking into account locality and site, this regionally-inflected approach distinguishes the work of Vilanova J. Artigas and Lina Bo Bardi, as much as a Swedish interpretation distinguishes architects such as Sigurd Lewerentz, Gunnar Asplund, from the works by the early Bauhaus masters (Gropius and Mies van der Rohe). Their interpretation of modernism was readily seen as differing from Gropius' Bauhaus modernism.

It is therefore revealing to study how modernist ideals were incorporated into a young, fast-growing and ambitious country like Brazil, with a legacy of contrasts and contradictions. The role of Lina Bo Bardi within modernism's evolution has rightly been rediscovered and is celebrated today, recognising her contribution as one of Brazil's most important, multifaceted architects. Understandably, her pre-Brasília projects (before 1955) and post-Brasília projects (after 1955) are very different in their entire attitude and approach: here is an architect who constantly evolved and absorbed ideas from the ordinary culture and the everyday lives of people around her. However, her influence as a key figure cannot be underestimated in shaping the movement and making significant contributions to the special place of Brazilian architecture in world architecture today. When the heroic white modernism of the Bauhaus and Russian constructivists arrived in Brazil, it was given a distinctively Brazilian interpretation.

It was another modernism that did not follow the style template of Philip Johnson's International Style (1935), but enriched architectural production in the second half of the 20th century. The white modernism from Europe was no longer accepted as the only model, in a "one size fits all" fashion, instead a diverse range of other modernisms without dogma emerged, what William Curtis called 'the process of absorption' (1982, p. 491).

References

- Acayaba, M. M., & Ficher, S. (1982). *Tendências regionais após 1960*. In *Arquitetura moderna brasileira*. São Paulo: Projeto.
- Andreoli, E., & Forty, A. (2004). *Brazil's modern architecture*. Munich: Phaidon.
- Artigas, J. V. (1981). *Os Caminhos da Arquitetura moderna*. São Paulo: Cosac & Naify.
- Artigas, R. C. (Ed.). (1997). *Vilanova Artigas (monograph in the series Brazilian Architects)*. São Paulo: Instituto Lina Bo e P.M. Bardi/Fundação Vilanova Artigas.
- Banham, R. (1962). *Guide to modern architecture*. London: Architectural Press.
- Bo Bardi, L. (1995). *Konkrete Poesie. Architektur ohne Grenzen*. Vienna: Architektur-Zentrum (Exhibition and Catalogue).
- Bo Bardi, L. (2012). *Stones against diamonds. Anthology of writings by Lina Bo Bardi, architecture words series*. London: Architectural Association Publications.
- Cavalcanti, L. (2003). *When Brazil was Modern: Guide to architecture 1928–1960*. New York: Princeton Architectural Press.
- Colquhoun, A. (1997). The concept of regionalism. In G. B. Nalbantoglu, & C. T. Wong (Eds.), *Postcolonial Space(s)*. New York: Princeton Architectural Press.
- Costa, M. E. (1995). *Lucio Costa: Registro de uma vivência*. São Paulo: Empresa das Artes.
- Curtis, W. J. R. (1982). *Modern architecture since 1900* (pp. 386–391). London: Phaidon Press.
- De Almeida Lima, Z. R. M. (2013). *Lina bo bardi*. New Haven: Yale University Press.
- Deckker, Z. Q. (2001). *Brazil Built: The Architecture of the Modern Movement in Brazil*. London and New York: Spon Press.
- Evenson, N. (1973). *Two Brazilian Capitals: Architecture and Urbanism in Rio de Janeiro and Brasília*. New Haven: Yale University Press.
- Ferraz, M. C. (Ed.). (1993). *Lina bo bardi (monograph in the series Brazilian architects)*. São Paulo: Instituto Lina Bo & P.M. Bardi.
- Frampton, K. (1983). Towards a critical regionalism: six points for an architecture of resistance. In H. Foster (Ed.), *The anti-aesthetic* (pp. 254–257). New York: New Press. And in: Kenneth Frampton (1983b) *Modern Architecture: A Critical History*. London: Thames and Hudson.
- Frampton, K. (1995). *Studies in Tectonic Culture: The Poetics of Construction in 19th and 20th Century Architecture*. Cambridge: MIT Press.
- Giddens, A. (1999). *Runaway world. How globalisation is reshaping our lives*. London: Thames and Hudson.
- Giedion, S. (1941). *Space, time and architecture*. Cambridge: Harvard University Press.
- Goodwin, P. (1942). *Brazil Builds: Architecture new and old, 1642–1942*. New York: Museum of Modern Art, Catalogue of the 1942/43 Exhibition.
- Herrle, P. (2008). Architecture and identity? Steppenwolf and the carriers of change. In P. Herrle, & E. Wegerhoff (Eds.), *Architecture and identity* (pp. 11–22). Münster: LIT-Verlag.
- Hitchcock, H.-R. (1955). *Latin american architecture since 1945*. New York: Museum of Modern Art, Exhibition and Catalogue.
- Joedicke, J. (1979). *Architektur im Umbruch* (pp. 53–55). Stuttgart: Karl Kraemer Verlag.
- Kamita, J. M. (2000). *Vilanova artigas (monograph)*. São Paulo: Cosac & Naify Edições.
- Lara, F. L. (2008). *The rise of popular modernist architecture in Brazil*. Miami: University Press of Florida.
- Le Corbusier. (1930). *Precisions on the present state of architecture and city planning*. Zurich: Park Books.
- Lefavre, L., & Tzonis, A. (2003). *Critical Regionalism: Architecture and identity in a globalised world*. Munich: Prestel Verlag.
- Lehmann, S. (1998). Zum Tode von Lucio Costa, 1902–1998, *DBZ Deutsche Bauzeitschrift*, No. 08 (pp. 32–34). Gütersloh: Bertelsmann.
- Lehmann, S. (2004). *Der Weg Brasiliens in die Moderne: Eine Bewertung und Einordnung der modernen Architektur Brasiliens, 1930–55*. Münster: LIT-Verlag.
- Lehmann, S. (2008). The work of vilanova artigas and lina bo bardi, 1950–1970. Regional identity and modern architecture in the postcolonial, Brazilian context. In P. Herrle, & E. Wegerhoff (Eds.), *Architecture and identity* (pp. 321–334). Münster: LIT-Verlag.
- Lehmann, S. (2014). Truth in the vernacular – contextualizing the late work of lina bo bardi. In A. Lepik (Ed.), *Lina bo bardi 100. Brazil's alternative path to modernism* (pp. 134–151). Munich: Architekturmuseum-Pinakothek der Moderne. Hatje Cantz, Stuttgart (English and German editions).
- Lehmann, S. (2016). Keeping the existing. Lina Bo Bardi's upcycling and urban renewal strategies. In A. Condello, & S. Lehmann (Eds.), *Sustainable lina. Adaptive reuse projects by lina bo bardi*. The Netherlands: Springer.
- Lima Zeuler, R. M. de A. (2013). *Lina bo bardi*. New Haven: Yale University Press.
- Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. (1972). *The limits to growth, club of Rome*.
- Mindlin, H. E. (1956). *Modern architecture in Brazil*. New York/London: Reinhold/Architectural Press.
- Niemeyer, O. (2000). *The curves of time. The memoirs of oscar niemeyer*. London: Phaidon.
- Papadaki, S. (1950). *The work of oscar niemeyer*. New York: Reinhold Publishing.
- Rudofsky, B. (1964). *Architecture without architects*. New York: Museum of Modern Art.
- Semper, G. (1860). *Der Stil in den technischen und tektonischen Künsten*. Dresden: Verlag der Kunst.
- Zein, R. V. (1998). *Other brazilian architectures* (pp. 14–18). Barcelona: 2G Revista Internacional de Arquitectura. No. 8.
- Zein, R. V. (2004). Regional study: Brazil. In *Paper presented at the international Conference on architecture and identity, Berlin, december*.